LA-UR-23-20067

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Title:	Proposed Nuclear Material Packaging Policy Changes for TA-55
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Intended for:	Nuclear Material Container Committee
Issued:	2023-01-05

Proposed Nuclear Material Packaging Policy Changes for TA-55

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December 12, 2022

The Big Picture of LANL Container Usage

- We need to be intentional about container usage
  - Phase in new containers (SAVY's)
  - Phase out old containers (Hagans and Ring Closure Drums)
  - Timing should be based on design life considerations and content
- We need a systematic approach to container policy changes
  - Ensure supply chain of new containers is sufficient to replace old containers
  - Minimize programmatic impact of major container changes
- We need to keep packaging training as simple as possible
  - How many people in the plant package Hagans and Ring drums?
  - If very few, then we could train most people only on SAVY packaging

Timeline of Significant Container Events at LANL

LA-UR- 99-2896

Title: SUMMARY OF PLUTONIUM OXIDE AND METAL STORAGE PACKAGE FAILURES

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1994
DNFSB Rec 94-1, Repackage Unstable Material

1995-1998
Curtis Interim Storage Criteria Hagan container introduced – 20-year design life intent

2000
DNFSB Rec 00-1, Accelerate stabilization/repackaging

2003
airborne release from container
Pu-238 uptake, 201b, Type B Investigation

2005
DNFSB Rec 05-1 - Issue NM Packaging Requirements

2005
airborne release from container
Pu-239 uptake, vault, internal investigation
Implement Respirators in Vault

2008-2011
DOE M441 SAVY container introduced

2011 Last Hagans Manufactured

2014 No New Hagans in Vault

2015-2016
SAVY Hatch TID wire corrosion/vault water bath evaporation
External Residue on XBPS333 Hagan

2022
airborne release from container
(100 area)
Hagan XBLS59

Proposal #1: Curtail new Hagan packaging TA-55 wide except for HEU

- Stopped allowing loaded Hagan containers in vault in April, 2014
  - *"Hagan containers are no longer authorized to be introduced into the TA-55 vault as of this procedure revision (with the exception of items that are removed and returned for measurement purposes only)." TA55-DOP-092 R4 April 7, 2014.*
- Propose curtailing the packaging and use of Hagans outside of the vault in safes and floor spaces in next revision of DOP-091/RD-1022 (2023)
- Restrict future Hagan container (threaded-top SNMCs) usage to items destined for waste, in glovebox usage, and/or inner container usage only.
- All existing Hagan packages used for storage outside of the TA-55 vault and outside of gloveboxes (safes and floor spaces) must be replaced with SAVY containers (or processed/discarded) within in 1 year of issuing the new procedure (126 Hagans as of August 8, 2022).

Proposal #1: Rationale for curtailing new Hagan packaging TA-55 wide except for HEU

- Hagan containers are not compliant with DOE M441.1-1
- The design life intent for Hagan containers is 20 years. The last production batch was 2011.
- Known Hagan NCR's
  - Potential leak at TID bar weld
  - Filter gasket degradation
- Known Hagan Design Issues
  - O-ring and groove design leads to minimal o-ring compression: minimal compression set or closure inconsistency can cause inadequate seal
  - ~2500 Hagan containers manufactured with 2-Threaded Lids (less drop resistant)

Proposal #2: Curtail packaging ring closure drums and require SAVY usage (except for HEU)

- Discontinue the packaging of material into 5 and 10 gallon ring drum containers in preference of SAVY containers.
- Existing ring drum packages with <A2 quantities of NM would be exempt
- Existing ring drum packages with >A2 quantities of NM would be replaced with SAVY's on an opportunistic basis (as they are handled).

Proposal #2: Rationale for curtailing packaging of ring closure drums and requiring SAVY usage (except for HEU)

- Ring drum containers do not meet DOE M441.1-1 requirements
- Ring drums are no longer being manufactured
- Ring drums were designed as Type A shipping containers
  - Gram quantities of plutonium over the road
  - We use them to store kg quantities plutonium in some cases

Proposal #3: Allow permanent overpacks of legacy containers (non-standard containers and Hagan containers)

- Allow permanent overpacks of legacy containers (non-standard containers and Hagan containers) into SAVY containers (without a new bag)
- Recommended in the following circumstances:
  - Where the legacy container is free of external contamination, and the final overpack meets criticality safety and DOE M441.1-1 requirements.
  - Where the SAVY container can be re-shelved in the same location as the original legacy container (minimal storage space impact)
  - Where facility constraints (criticality limits, measurement issues, PPD restrictions, etc.) will hinder the disposition of the legacy container beyond what is reasonable, e.g. 30-40 yr old non-standards
- Campaigns could be considered, e.g., to accelerate the release of specific vault rooms for non-respirator use, with considerations for balancing relative risks of external vs. internal dose, short-term risk vs. long-term risk, etc.

Proposal #3: Rationale for allowing permanent overpacks of legacy containers (non-standard containers and Hagan containers) in SAVY's

- SAVY containers are DOE M441.1-1 compliant
- Nesting was specifically contemplated in the design
- There is a need to release vault rooms for non-respirator use to support 30 PPY
- The current rate of repack/consolidation/discard does not address the urgency associated with >150 non-standards >30 years old and >500 Hagan containers >20 years old (20 years was the nominal design life of the Hagan)
- It buys time to address constraints associated with processing, criticality safety, and NDA measurement limitations

Proposal #3: Rationale for allowing permanent overpacks of legacy containers (non-standard containers and Hagan containers) continued

- The Hagans fit inside of the next SAVY size up without a bagout bag

SAVY Size	Inside Diameter (in)	Inside Height (in)	Hagan Size	Outside Diameter (in)	Outside Height (in)	Excess Diameter (in)	Excess Height (in)	Will Hagan nest inside SAVY?
1Q	3.7	4.4	NA	NA	NA	NA	NA	NA
3Q	5.4	6.8	1Q	4.8	5.7	0.6	1.1	yes
5Q	6.61	9.96	3Q	6.5	8	0.11	1.96	yes
8Q	7.76	11.46	5Q	7.4	10	0.36	1.46	yes
12Q	8.9	13.94	8Q	8.6	11.7	0.3	2.24	yes

Discussion/Feedback

- The overall package weight must meet procedural limits
- Impact of external dose associated with overpacking must be considered
- Consider limiting overpacking to a single occurrence to prevent multiple nesting over time
- Criticality limitation of metal wall thickness must be considered
- Consider a different term than permanent overpack